PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Lower Columbia River Wetlands Restoration And Evaluation Program

BPA project number: 9902500
Contract renewal date (mm/yyyy): ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
USDA Forest Service, Columbia River Gorge National Scenic Area

Business acronym (if appropriate) USFS, CRGNSA

Proposal contact person or principal investigator:

Name	Virginia Kelly
Mailing Address	902 Wasco Ave., Suite 200
City, ST Zip	Hood River, OR 97031
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NPPC Program Measure Number(s) which this project addresses
11.3E.1

FWS/NMFS Biological Opinion Number(s) which this project addresses
N/A

Other planning document references
Sandy River Delta Watershed Analysis (page 16)
Sandy River Delta Plan (pages 17-18)
Sandy River Delta Plan Final Environmental Impact Statement (page 2-32)
Columbia River Gorge National Scenic Area Management Plan (page III-38)
Northwest Forest Plan (page B-11)

Short description
Restore 200 acres of wetland and associated upland habitat at Sandy River Delta. Restoration would be part of a series of large scale Lower Columbia River wetlands GIS mapping, habitat restoration, and evaluation and monitoring experiments.

Target species

Breeding/migrating waterfowl, herptiles, raptors, other native wildlife/plants. Great blue heron, Spotted sandpiper, yellow warbler, black-capped chickadee, band-tailed pigeon, painted turtle, red-legged frog, Western pond turtle, lesser scaup, and mink.

Section 2. Sorting and evaluation

Subbasin
Sandy and Lower Columbia

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☐ Anadromous fish ☐ Resident fish ☒ Wildlife	☐ Multi-year (milestone-based evaluation) ☐ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☐ New construction ☒ Research & monitoring ☒ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9902600	Sandy River Delta Riparian ReForestation	Close physical proximity

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1997	Installed water control structures	Yes
1998	Developed baseline data, strategies	Yes
1999	Disked 200 acres, began monitoring	in progress; no findings

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	GIS Development	a	GIS Inventory - Regionwide
		b	GIS Inventory - NWR Unit Level
		c	Develop GIS database
		d	Develop GIS database for Sandy River Delta
2	Wetland Habitat Restoration	e	Hydrologic Control
		f	Identify Possible Restoration Tech
		g	Choose Restoration Sites and Tech
		h	Collect Baseline Vegetative Cover and Wildlife Use Data
		i	Active Restoration
		j	Experimental Wetland Creation
		k	Compare Restoration Responses
3	Monitoring and Evaluation	l	Aerial Photography
		m	General Habitat Response
		n	Detailed Vegetation Control Study for Reed Canary Grass
		o	Wildlife Surveys
		p	Monitor Water Levels
4	Establish HEP Values	q	Establish HEP Values

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/1997	9/2001	GIS completed	x	0.00%
2	1/1997	9/2001	200 acres restored	x	51.00%
3	10/1998	9/2001	Monitoring Complete	x	35.00%
4	10/1999	9/2000	HEP values established	x	14.00%
				Total	100.00%

Schedule constraints
None known at this time.

Completion date
9/2001

Section 5. Budget

FY99 project budget (BPA obligated): $125,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	Water level monitoring	%2	3,000
Fringe benefits			0
Supplies, materials, non-expendable property			0
Operations & maintenance			0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Land purchased by Forest Service in 1991.		0
NEPA costs	EIS completed by USFS in 1996		0
Construction-related support			0
PIT tags	# of tags:		0
Travel			0
Indirect costs			0
Subcontractor		%97	122,000
Other			0
TOTAL BPA FY2000 BUDGET REQUEST			$125,000

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
Ducks Unlimited	Cash, Engineering, Wildlife Monitoring, Admin.	%11	36,000
US Fish and Wildlife	In-kind, Cash	%31	94,000
OR Dept Fish/Wildlife	Cash	%0	3,000
National Forest Found	Cash	%4	15,000
National F&W Found	Cash	%5	18,000
Portland State Univ.	Wetland Delineation	%1	6,000

USDA Forest Service	Administration, Coordination	%1	5,000
Total project cost (including BPA portion)			$302,000

Outyear costs

	FY2001	**FY02**	**FY03**	**FY04**
Total budget	$125,000			

Section 6. References

Watershed?	**Reference**
☐	Columbia River Gorge Commission, and USDA Forest Service. 1992. Management Plan for the Columbia River Gorge National Scenic Area. Columbia River Gorge Commission, White Salmon, Washington.
☐	Salix Associates. 1992. Sandy River Delta Inventory. Unpublished. On file at Columbia River Gorge National Scenic Area, Hood River, Oregon.
☒	USDA Forest Service, Columbia River Gorge National Scenic Area. 1994. Sandy River Delta Watershed Analysis. Unpublished. On file at Columbia River Gorge National Scenic Area, Hood River, Oregon.
☐	USDA Forest Service, Columbia River Gorge National Scenic Area. 1996. Sandy River Delta Plan. USDA Forest Service, Hood River, Oregon
☐	USDA Forest Service, Columbia River Gorge National Scenic Area. 1996. Sandy River Delta Final Environmental Impact Statement. USDA Forest Service, Hood River, Oregon
☒	USDA Forest Service, Columbia River Gorge National Scenic Area and Mt. Hood National Forest. 1998. Columbia Tributaries East Watershed Analysis. USDA Forest Service, Hood River, Oregon.
☒	USDA Forest Service, Columbia River Gorge National Scenic Area. Columbia Tributaries West Watershed Analysis. (in progress).
☐	USDA Forest Service and USDI Bureau of Land Management. 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the range of the Northern Spotted Owl. (Also known as the Northwest Forest Plan

PART II - NARRATIVE

Section 7. Abstract

Proposed Action: The overall program consists of Lower Columbia River wetlands GIS mapping, habitat restoration, and evaluation and monitoring. This proposal requests funds to restore 200 acres of wetland and associated upland habitat at Sandy River Delta, and monitor and evaluate restoration success. Restoration, monitoring and evaluation at Sandy River Delta would be part of a series of large scale lower Columbia River habitat restoration and evaluation experiments.

Expected Benefits (1994 FWP program goals): Wetland restoration (increased wetland acreage, increased open water, longer wet season, and increased plant diversity) will improve habitat for a community of native plants and animals, including breeding/migrating waterfowl, herptiles, raptors, and other native wildlife and plants. Sandy River Delta is on the Pacific Flyway and is used by a variety of waterfowl and shorebirds. The great blue heron, Canada goose, Spotted sandpiper, yellow warbler and black-capped chickadee have been observed at Sandy River Delta. The band-tailed pigeon, Western pond turtle, lesser scaup and mink potentially occur. A large population of herptiles (including red-legged frogs) is present (Salix, 1992).

Mitigation: Replace riparian forest habitat inundated above Bonneville Dam (in-kind, not in-place).

Methods: Apply US Fish and Wildlife Service (USFWS) developed and tested wetland restoration strategies on a landscape basis.

Outcomes:
1. A wetland restoration and management model that can be implemented in other watersheds of the Pacific Northwest.
2. Restoration of 200 wetland acres at Sandy River Delta.

Habitat Monitoring:
Evaluate restoration response based on:
1. Aerial photography interpretation.
2. Ground based surveys.

Section 8. Project description

a. Technical and/or scientific background

Introduction: The USDA Forest Service, Columbia River Gorge National Scenic Area is pleased to work with Ducks Unlimited in implementing *The Lower Columbia River Wetlands Restoration and Evaluation Program.* Ducks Unlimited has chosen the Sandy

River Delta (managed by the Forest Service) as a habitat restoration, and monitoring and evaluation site.

Proposed Action: The Lower Columbia River Wetlands Restoration and Evaluation Program is a five-year effort proposed by Ducks Unlimited (DU) that fully integrates wetland and riparian restoration with adaptive resource management principles. The objective is to provide a wetland restoration and management model that can be implemented in other watersheds of the Pacific Northwest. By applying US Fish and Wildlife Service (USFWS) developed and tested restoration strategies on a landscape basis, Ducks Unlimited proposes to work with its partners to monitor the success of seasonal wetlands management as measured by hydrologic response, vegetation diversity and wildlife use (particularly birds). This effort has never been undertaken to this scale in the Pacific Northwest. Also, management guidelines for seasonal of permanent wetlands have never been comprehensively assessed in the region. This cooperative effort is the most significant wetlands and migratory bird, habitat program undertaken in the Pacific Northwest.

The program will be undertaken in three phases: GIS mapping, habitat restoration, and evaluation and monitoring. We are seeking funds from the Bonneville Power Administration (BPA) to complete 200 acres of habitat restoration on Sandy River Delta and for habitat evaluation and monitoring. The Forest Service (proposal proponent) manages Sandy River Delta.

BPA funds would also directly support North American Wetlands Conservation Grant efforts by the partners of the ecoregion program.

Regional History: The Columbia River hydropower system massively altered the river's riparian habitat. Bonneville Dam inundated most of the floodplain habitat in the Columbia Gorge. (Columbia Tributaries East Watershed Analysis, USDA Forest Service 1998 and Columbia Tributaries West Watershed Analysis, USDA Forest Service (in progress)). Downstream of Bonneville Dam, the Columbia River dam system massively altered flood patterns, the predominant natural disturbance regime. In addition, the extensive pre-European settlement wetlands, prairies and riparian forests of the lower Columbia River have been cleared, diked, drained, farmed and urbanized (Sandy River Delta Watershed Analysis, USDA Forest Service, 1994).

Ducks Unlimited Conservation Strategy: Ducks Unlimited (DU) has developed a five-year conservation strategy for the Pacific Northwest. The Northwest conservation plan organizes DU's habitat efforts into seven focus areas. These focus areas are geographic regions that share waterfowl use patterns and similar wetland threats and wetland solutions. DU will coordinate wetland priorities detailed in the Northwest Conservation Plan with those of the Upper Pacific Coast Joint Venture and the Intermountain Habitat Joint Venture. Both joint ventures are multi-cooperator efforts to implement the North American Waterfowl Management Plan. DU's focus areas mirror those in both joint ventures.

The Lower Columbia River Focus Area (Lower Columbia) includes the bottomlands and riverine habitats on both sides of the river from Bonneville Dam to the river mouth, Although there are no dams below Bonneville Dam, the Lower Columbia has been dramatically altered through dredging, dikes, and flood control levees. Flat alluvial plains associated with the river support the remainder of the freshwater marshes and bottomlands. Most of these bottomlands have been converted to pastures with some planted in grains. An increasing trend has been the conversion of these pastures to hardwood crops, trees grown for commercial purposes. Combined, these land use changes threaten the region's prime wetlands and associated wildlife.

The Lower Columbia River Ecoregion has the highest concentration of DU projects in Oregon and Washington combined, and DU will continue to make the Lower Columbia River a priority area for habitat protection. DU's projects have focused on expanding public refuges in both Oregon and Washington, and developing seasonal and permanent marshes on refuges. Through the grant program, MARSH (Matching Aid to Restore States Habitats), Since 1988, DU has invested $151,800 in the Vancouver Bottoms and floodplain habitat in Washington and Oregon. These dollars leveraged $529,700 and have helped restore and enhance nearly 3,570 acres.

U.S. Forest Service Management Direction for the Sandy River Delta: The Sandy River Delta, located just east of the Portland, Oregon metropolitan area, is located at the confluence of the Sandy and Columbia Rivers. The Forest Service, CRGNSA, bought the Delta in 1991 and began master planning in 1992.

The 1400 acre Sandy River Delta is the last large undeveloped remnant of Columbia River floodplain in the Portland area. The Delta has enormous potential for wetland, prairie and riparian forest restoration. Sandy River Delta is undeveloped, but hardly undisturbed. Before European settlement, it was largely forested, with some level "prairies", small lakes and wetlands. Beginning in the late 1800's, forests were cleared for grazing. Later, ditches were installed to drain wetlands. Prior to the Columbia River damming, annual spring floods in the 800,000 cfs range were common, with periodic large floods over 1,000,000 cfs. Now, floods in the 200,000 cfs range are uncommon (Sandy River Delta Watershed Analysis, USDA Forest Service, 1994). As a result, the land is massively altered. It's natural disturbance regime was altered by the dam system, and the land has been cleared, drained, diked, grazed, seeded and invaded by undesirable species.

A completed comprehensive management plan (Sandy River Delta Plan and EIS, 1996) envisions wetland, riparian forest, upland forest, upland meadow and shrub-scrub restoration, along with moderate recreation and natural resource interpretation. The Sandy River Delta Plan divided the 1400 acre parcel into two distinct management areas. The northern 600 acre "Sundial Island" will be primarily reforested with riparian tree species to create a dense "gallery" old growth riparian forest. A shrub-scrub community will be created under Bonneville Power Administration powerlines due to vegetation height restrictions. Wetland restoration and upland meadow enhancement are desired on the southern 800 acre "Thousand Acres".

In 1997, the Forest Service and Ducks Unlimited jointly installed three water control structures to retain water now draining from the Sandy River Delta. While stabilizing the water supply was a crucial first step in wetland restoration, significant work remains in managing the competing, non-native vegetation. Existing wetlands are choked by reed canary grass. The Forest Service now has the opportunity to join Ducks Unlimited and several other partners in a large scale wetland habitat restoration, and evaluation and monitoring program.

Mitigation: Wetlands enhancement will mitigate habitat losses upstream of Bonneville dam. As such, in-kind, not in-place mitigation would result.

Partners: The Forest Service and Ducks Unlimited installed three water control structures in 1997, with additional funds provided by the National Forest Foundation, National Fish and Wildlife Foundation, and Oregon Department of Fish and Wildlife. Ducks Unlimited, the US Fish and Wildlife Service and University of Idaho plan to include the Sandy River Delta in a Lower Columbia River Wetlands Restoration and Evaluation Program.

b. Rationale and significance to Regional Programs

1994 Fish and Wildlife Program Goals: Wetland restoration (increased wetland acreage, increased open water, longer wet season, and increased plant diversity) will improve habitat for a community of native plants and animals, including breeding/migrating waterfowl, herptiles, raptors, and other native wildlife and plants. Sandy River Delta is on the Pacific Flyway and is used by a variety of waterfowl and shorebirds. The great blue heron, Canada goose, Spotted sandpiper, yellow warbler and black-capped chickadee have all been observed at Sandy River Delta. The band-tailed pigeon, Western pond turtle, lesser scaup and mink potentially occur. A large population of herptiles (including red-legged frogs) is present.

Mitigation: Wetlands enhancement will mitigate habitat losses upstream of Bonneville dam. As such, in-kind, not in-place mitigation would result.

Regional Significance
A wetlands restoration and monitoring/evaluation program on this scale has never been undertaken in the Pacific Northwest. Also, management guidelines for seasonal of permanent wetlands have never been comprehensively assessed in the region. This cooperative effort is the most significant wetlands and migratory bird habitat program undertaken in the Pacific Northwest.

c. Relationships to other projects

The proposed project takes place in close proximity to the Sandy River Delta Riparian Reforestation project (project 99-026-00). Separate proposals are submitted for each project due to the differing nature of the work.

d. Project history (for ongoing projects)

1997, 1998: Ducks Unlimited and the Forest Service installed three water control structures to retain water which previously flowed through man-made drainage ditches. Funded by Ducks Unlimited, Forest Service, National Forest Foundation, National Fish and Wildlife Foundation, Oregon Department of Fish and Wildlife. Cost: $101,000 (design, contract management and installation).

Vegetation plots chosen, wetland management regimes chosen.

Findings: Water control structures were not closed until November, 1998, so no findings as yet.

1999: Project Number: 99-025-00. First year of BPA funding. Two hundred acres disked in October, 1998 (BPA funded). Water control structures closed in November. No results available at time of this submittal (December 9, 1998).

e. Proposal objectives

Objective 1: GIS Development
BPA funding is NOT requested for this objective

Ducks Unlimited proposes to produce a baseline landcover inventory to determine the current condition of five refuges that form the Ridgefield Complex. The landcover types mapped can be interpreted into habitat types that provide benefit to specific wildlife species. Habitat definitions will undoubtedly vary depending on the wildlife species of interest- However, having a baseline landcover map will provide the key element for allowing habitat interpretations following standard classification systems, such as NOAA C-CAP which is a combination of Cowardin et. al 1979, Anderson et. al 1976, and USGS 1992.

GIS will aid in the longer-term monitoring and evaluation effort proposed by Ducks Unlimited along the Lower Columbia River. The resulting GIS database will also be useful to assist in selecting optimal sites for future restoration/ enhancement projects. The product will be a comprehensive database that maintains both regional and site specific landcover and wildlife data. The following four specific tasks will be integrated into a single comprehensive GIS database:

1) Develop region-wide landcover classification for each watershed to understand habitat both within and outside of wetland restoration areas.
2) Develop more detailed vegetation classification for the wetland restoration areas.
3) Develop GIS database to monitor changes in restored wetland basins.
4) Develop GIS database for Sandy River Delta to monitor changes in restored wetland basins.

Objective 2: Habitat Restoration
BPA funding is requested only for the Sandy River Delta site

Because wetland restoration is a relatively new management activity in the Pacific Northwest (and will probably be the major form of management over the next two decades), it is important that we determine the best and most cost-effective techniques for these programs. These studies will be conducted on two USFWS refuges, one ODFW refuge, two WDFW refuges, and one USFS refuge, Sandy River Delta.

The restoration and evaluation project will have four general objectives for wetland restoration and management methods:

1) Identify which methods are most appropriate for producing the desired effect (e.g., vegetative and wildlife response).
2) Determine how these methods may be modified to improve our management ability in the most cost-effective manner (i.e., adaptive management).
3) Document the contribution of restored wetlands to biodiversity on the refuges.
4) Experiment with a small wetland creation to evaluate wetland creation feasibiliy on a larger scale.

Objective 3: Monitoring and Evaluation
BPA funding is requested only for the Sandy River Delta site

Evaluation and monitoring will be conducted at Sandy River Delta to assist in determining the success of wetland restoration and to develop management recommendations to wildlife area managers. DU has been contracted by the USFS to develop such guidelines for Sandy River Delta. DU will employ adaptive management practices as part of the management strategy for Sandy River Delta.

Objective 4: Establish HEP Values
BPA funding is requested only for the Sandy River Delta site

The need for a HEP analysis was not known when the FY99 project was submitted. Therefore, the FY1999 budget and schedule did not program funds or time for this task. We are requesting funds for a HEP analysis in FY2000. Task to be contracted to Ducks Unlimited and University of Idaho.

f. Methods

Objective 1: GIS Development
BPA funding is NOT requested for this objective in FY2000.

Task a. GIS Inventory - Regionwide
Develop a consistent landcover classification using satellite imagery for a large regional area encompassing approximately 50 miles of the Columbia River from Bonneville Dam down river to the confluence of the Lewis and Columbia rivers. The one hundred year

flood elevation contour bounds the project area. *Task in progress; expected completion by 9/2000. Funded by USFWS ($45,000).*

Task b. GIS Inventory - NWR Unit Level

Develop a more detailed landcover inventory for five refuges of the Ridgefield NWR Complex. These refuges include: Ridgefield, Steigerwald, Pierce, Franz Lake and Conboy refuges (Figure 1). DU will use a combination of multi-spectral digital aerial imagery, large scale conventional photography, and field verification. *Task in progress; expected completion by 9/2000. Funded by USFWS* ($55,000).

Task c. Develop a GIS database

Develop a GIS database to monitor changes in wetland basins restored on USFWS, ODFW, WDFW refuges on the Lower Columbia River. This effort will support ground evaluations. *Funds for this effort will need to be secured. They are not being requested in this proposal (estimated costs are $40,000 per year for three years).*

Task d. Develop GIS database for Sandy River Delta

Develop GIS database for Sandy River Delta to monitor changes in restored wetland basins. This effort will support ground evaluations. *Task funded by FY1999 BPA grant ($20,000).*

Objective 2: Wetland Habitat Restoration

Task e. Hydrologic Control
Install water control structures to capture water draining from the site through man-made ditches. *Task completed in October, 1997 and funded by Ducks Unlimited, Forest Service, Oregon Department of Fish and Wildlife, National Forest Foundation and National Fish and Wildlife Foundation ($101,000).*

Task f. Identify Possible Restoration Techniques
Identify possible wetland restoration techniques and variables that may influence habitat and wildlife response (i.e., pre-inundation manipulations, size, depth, soil, precipitation, post-inundation manipulations, etc.). Predict wetland responses for vegetation, wildlife, hydrology, etc. and for a "control" option of no management. Select the "two predicted best" options for wetland treatment. *Task completed in September 1997. Funded by Ducks Unlimited, US Fish & Wildlife Service, Forest Service ($2,000).*

Task g. Choose Restoration Sites and Techniques
Identify (map and number) all restoration sites, determine their size and projected date of restoration. Systematically assign one of the three options noted in Task f above to all restoration sites, aiming for a relatively equal sample in each option for each year of restoration activity. *Task completed in Summer, 1998. Funded by Ducks Unlimited ,US Fish & Wildlife Service, Forest Service ($2,000).*

Task h. Collect Baseline Vegetative Cover and Wildlife Use Data
Collect pre-restoration data to document vegetative cover and wildlife use. Use baseline information for GIS change detection, and for consideration of wetland response to each of the management options. *Task completed in Summer, 1998. Funded by Ducks Unlimited and US Fish & Wildlife Service ($2,000).*

Task i. Active Restoration
The goal of active restoration is to transform the existing Reed Canary Grass to a more productive wetland type, such as open water and emergent vegetation, using water management techniques. Methods at Sandy River Delta include disking, flooding and potentially herbicide spraying with *Rodeo*. Two hundred acres were projected to be disked four times in FY99. We expect to need to disk twice in FY2000 ($16,000).
Funds requested from BPA.

Task j. Experimental Wetland Creation
Up to an additional five acres of forested and/or shrub-scrub wetland would be created through land sculpting, removal of invasive vegetation and dense planting. A small experimental wetland creation would allow us to evaluate the feasibility of wetland creation on a larger scale ($56,000).
Funds requested from BPA.

Task k. Compare Restoration Responses

Three years after the last series of restorations (approximately 2001), we will compare wetland restoration responses under each option, and those responses will also be compared with predictions established at the initiation of the project. An analysis of covariance (ANCOVA) will be used to compare all three management options groups. At this point we will have the opportunity to learn if our management options resulted in our predicted wetland response, and to alter our management program if necessary. Ideally, alteration of management techniques should be systematically applied to a new sample of wetland restoration sites to continue the learning process. Our analysis will also provide an opportunity to assess expenses associated with the management option for a cost/benefit analysis.

Objective 3: Monitoring and Evaluation

An important component of the entire program will be evaluation and monitoring of the restored wetland sites. Evaluation and monitoring will be conducted on 45 wetland restoration basins covering 6 wildlife management areas to assist in determining the success of wetland restoration projects and to develop management recommendations to wildlife area managers. Each restored wetland site will be monitored for three years minimum to document succession of wetland vegetation and wildlife use.

In an attempt to provide objective results, Ducks Unlimited will contract Dr. John Ratti (Adjunct Professor, University of ldaho),to conduct the evaluation and monitoring phase. Dr. Ratti will actively participate in the evaluation research, will supervise field assistants, and will coordinate all research activities with appropriate refuge personnel and Ducks Unlimited (DU) staff.

Task l. Aerial Photography
Collect new true color or color infrared aerial photography each year for restoration areas. Classify wetland areas into open water, Reed Canary Grass, tulle, cattail, etc. Scan photography into computer format, manage as GIS database component. Photos to be collected at five year intervals. Photos were collected in 1994; and will be collected in 1999 and again in 2004. *The 1999 aerial photography funded by FY1999 BPA funds ($5,000).*

Task m. General Habitat Response
Conduct systematic vegetation surveys on entire 200 acre restoration area to determine general vegetation and habitat response. Establish control sites to evaluate untreated areas. Assure consistent and repeatable ground surveys via GPS. Track restoration progress with annual oblique ground photographs via digital camera ($15,000).
Funds requested from BPA.

Task n. Detailed Vegetation Control Study for Reed Canary Grass
Conduct systematic vegetation surveys on identified sample plot; establish transects, conduct stem counts. Establish control sites to evaluate untreated areas. Assure consistent and repeatable ground surveys via GPS. Track restoration progress with annual oblique ground photographs via digital camera ($15,000).
Funds requested from BPA.

Task o. Wildlife Surveys
Conduct systematic biweekly wildlife surveys to identify wildlife species, numbers of animals counted and habitat condition. Establish control sites to evaluate untreated areas. Assure consistent and repeatable ground surveys via GPS. Track restoration progress with annual oblique ground photographs via digital camera. *Task funded by Ducks Unlimited ($17,000).*

Task p. Monitor Water Levels
Collect water depth data at least monthly at each of three water control structures, calculate acre feet inundated. Delineate extent of inundation on the ground (using pin flags or similar method) and map ($3,000).
Funds requested from BPA.

Objective 4: Establish HEP Values

Task q. Establish HEP Values
The need for a HEP analysis was not known when the FY99 project was submitted. Therefore, the budget and schedule did not program funds or time for this task ($20,000).
Funds requested by BPA.

Environmental Protections/Risks to Habitats, Organisms or Humans: The existing wildlife habitat quality is quite low, due to invasive plant species. Temporary disruption to wildlife would be more than compensated by enhanced habitat.

No endangered or threatened plant and animal species are presently located in the project area, and none will be affected by the project. A sensitive species, the red-legged frog, is located in the project area. Timing of disruptive activities (e.g. disking) will be limited to the driest time of the year (July-September).

Forest Service guidelines for herbicide application would be strictly followed to ensure operator, public, fish and wildlife safety. Only *Rodeo* (a glyphosphate approved for riparian areas) would be used. Glyphosphate breaks down quickly, and has been shown non-toxic to fish and wildlife. Signs would be posted to inform the public of herbicide application dates and locations.

Expected results:

1). Restoration of 200 acres of wetland habitat at Sandy River Delta. Wetland habitat enhancement will improve habitat for breeding and migrating waterfowl, herptiles, raptors, other native wildlife/plants. Great blue heron, Spotted sandpiper, yellow warbler, black-capped chickadee, band-tailed pigeon, painted turtle, red-legged frog, Western pond turtle, lesser scaup, and mink are known or suspected to occur at Sandy River Delta.

2) Verifiable, cost effective wetland management recommendations for regional wetland managers.

g. Facilities and equipment

- Restoration equipment: The Forest Service and its partners either have, or can contract, the necessary equipment.
- Vehicles: the Forest Service and partners have adequate vehicles.
- Monitoring equipment: the partners would supply monitoring equipment.
- The Forest Service has adequate office space and computers; no lab space is needed.

h. Budget

BPA funding is requested for six specific tasks of the program's 17 tasks.

Task i. Active Restoration: $16,000
We expect to need to disk twice in FY2000. Based upon recent costs for this work, the budget is projected for $16,000. The task will be contracted to Ducks Unlimited, then subcontracted to private sector.

Task j. Experimental Wetland Creation: $56,000
Land sculpting, removal of invasive vegetation and dense planting for up to an additional five acres of forested and/or shrub-scrub wetland is budgeted for $57,000. The chosen site will be adjacent to existing wetland area to take ensure a water source. The task will be contracted to Ducks Unlimited, then subcontracted to private sector as necessary.

Task m. General Habitat Response: $15,000
Costs are based on Ducks Unlimited and University of Idaho projected budgets. The task will be contracted to Ducks Unlimited, then subcontracted University of Idaho.

Task n. Detailed Vegetation Control Study for Reed Canary Grass: $15,000
Costs are based on Ducks Unlimited and U.S. Fish and Wildlife projected budgets. The task will be contracted to Ducks Unlimited.

Task p. Monitor Water Levels: $3,000
Costs are based on Forest Service personnel costs and expected time to complete task. Forest Service will perform task.

Task r. Establish HEP Values: $20,000

Because BPA has not determined HEP values for target species, we are requesting $20,000 for this task. The task will be contracted to Ducks Unlimited, then subcontracted University of Idaho.

Section 9. Key personnel

US Forest Service

Dobson, Robin. Restoration Project Manager. Botanist/Ecologist, USDA Forest Service, Columbia River Gorge National Scenic Area. Full time appointment, approximately 6 weeks per year dedicated to Sandy River Delta project. Phd, Plant Pathology, Washington State University (1983); MS, Plant Pathology, Washington State University (1978); BS, Biochemistry, UC Davis (1972). Over 12 years experience in ecology and botany. Currently manages Sandy River Delta restoration. Restoration manager for East Pit (quarry pit) restoration, 1997/1998 and Historic Columbia River Highway revegetation, 1998.

Kelly, Virginia. Sandy River Delta Team Leader. Planning Team Leader, USDA Forest Service, Columbia River Gorge National Scenic Area. Full time appointment, approximately 4 weeks per year dedicated to Sandy River Delta project. MLA, Landscape Architecture and Environmental Planning, UC Berkeley, 1989; BA Biology, Oberlin College, 1982. Over 10 years experience in Environmental Planning. Responsible for overall Sandy River Delta coordination, grant writing, grant reporting, budget management.

Larson, Richard. Project Biologist. Fish/Wildlife Biologist, USDA Forest Service, Columbia River Gorge National Scenic Area. Full time appointment. BS, Fisheries Biology, Oregon State University (1974). Over 15+ years with federal government in fish/ wildlife program management.

Anderson, Eric. Project Assistant. Biological Technician, USDA Forest Service, Columbia River Gorge National Scenic Area. Temporary appointment, approximately 6 weeks per year dedicated to Sandy River Delta project. BS, Biology, University of Wisconsin (1993). Currently assists in Sandy River Delta restoration; orders supplies and equipment, field review when project manager is unavailable.

Key Partner Personnel

Engilis, Andrew. Manager, Pacific Northwest Program. Senior Regional Biologist, Ducks Unlimited. Post-graduate studies, University of Hawaii; BS, UC Davis. Provides technical guidance and biological assessment for DU cooperative projects. 10 years experience with Ducks Unlimited. Currently provides overall program direction for the Lower Columbia River Wetlands Restoration and Evaluation Program.

Liske, Steve. Sandy River Delta Project Engineer. Regional Engineer, Dicks Unlimited.

BS, Civil Engineering, California State University, Sacramento (1987). Registered professional engineer in Oregon, Washington and California. Involved in over 70 restoration projects, including survey, design, inspection and construction management. Currently provides engineering expertise to Sandy River Delta project.

Boon, Lori. Project Biologist. Pacific Northwest Project Biologist, Ducks Unlimited. MS, Zoology, University of Western Ontario, Canada; BS, Forestry, University of New Brunswick, Canada. Three years experience with Ducks Unlimited. Currently responsible for waterfowl monitoring and vegetation monitoring at Sandy River Delta.

Ratti, John. Habitat Evaluation and Monitoring Manager. University of Idaho. Responsible for overall habitat monitoring research design; habitat monitoring program implementation.

Dan Golner. Biologist. University of Idaho. Responsible for general habitat monitoring and waterfowl monitoring at Sandy River Delta.

Section 10. Information/technology transfer

A wetlands restoration and monitoring/evaluation program on this scale has never been undertaken in the Pacific Northwest. Also, management guidelines for seasonal of permanent wetlands have never been comprehensively assessed in the region. This cooperative effort is the most significant wetlands and migratory bird habitat program undertaken in the Pacific Northwest.

The results would have applicability for other land managers in the area. Results would be shared through formal and informal networking with other land managers in the area.

Congratulations!